

Abstract

A voice coil actuator is disclosed which provides a proportional solenoid type characteristic and in which first and second magnets are positioned at different ends of a first soft magnetic pole piece and magnetized in opposite directions, the first soft magnetic pole piece having a length greater than the length of the first magnet and the length of the second magnet. A coil having a length less than the lengths of the first soft magnetic pole piece is positioned for travel along an axis common to the first soft magnetic pole piece and first and second magnets, and a structure provides a magnetic path between free ends of the first and second magnets.